The Bakken Play in Montana

Managing Rapid Population and Economic Growth

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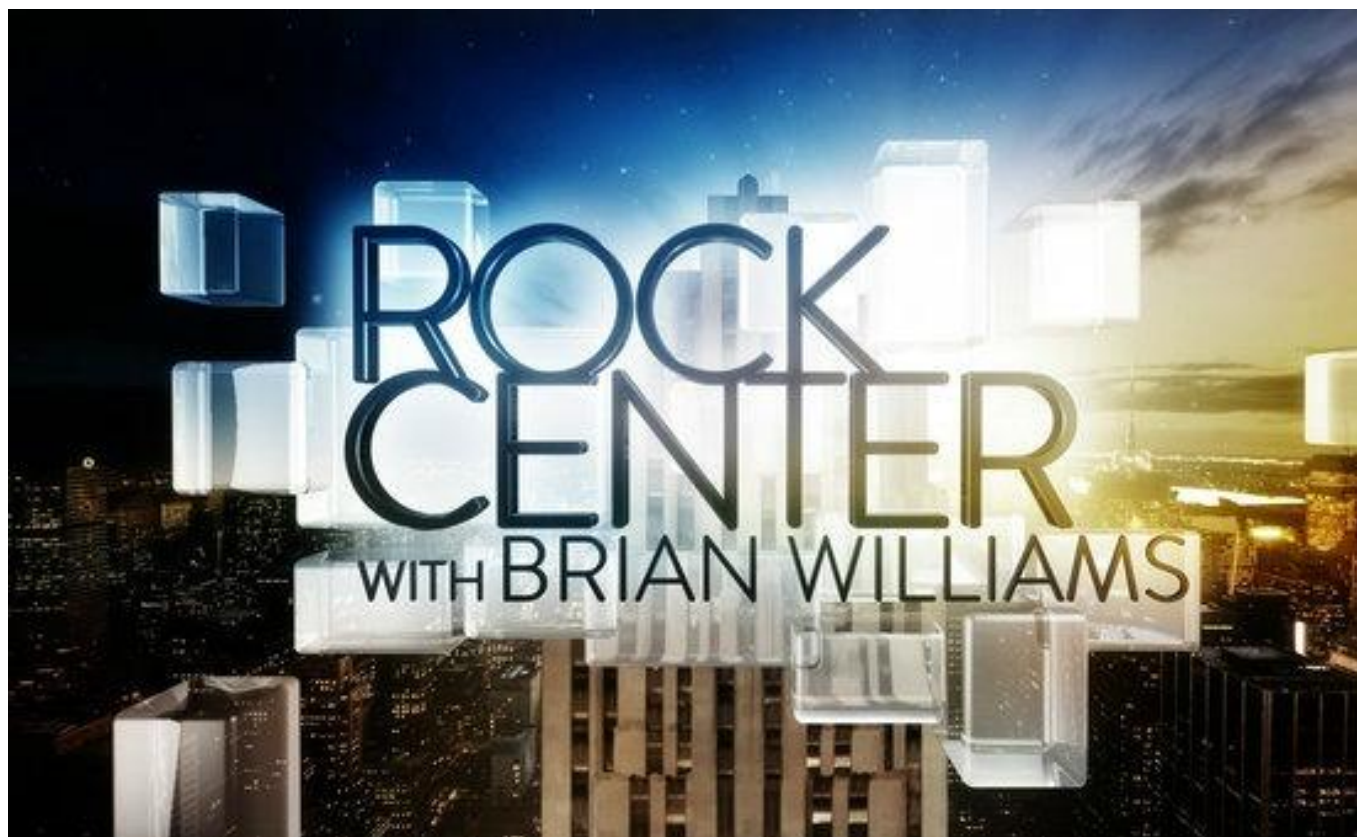
Montana Department of Commerce

CTAP

Community Technical Assistance Program (CTAP) provides land use and planning advice to local governments, planning departments, private developers, non-profit organizations and the public in order to encourage the planning and sustainable development of Montana communities.
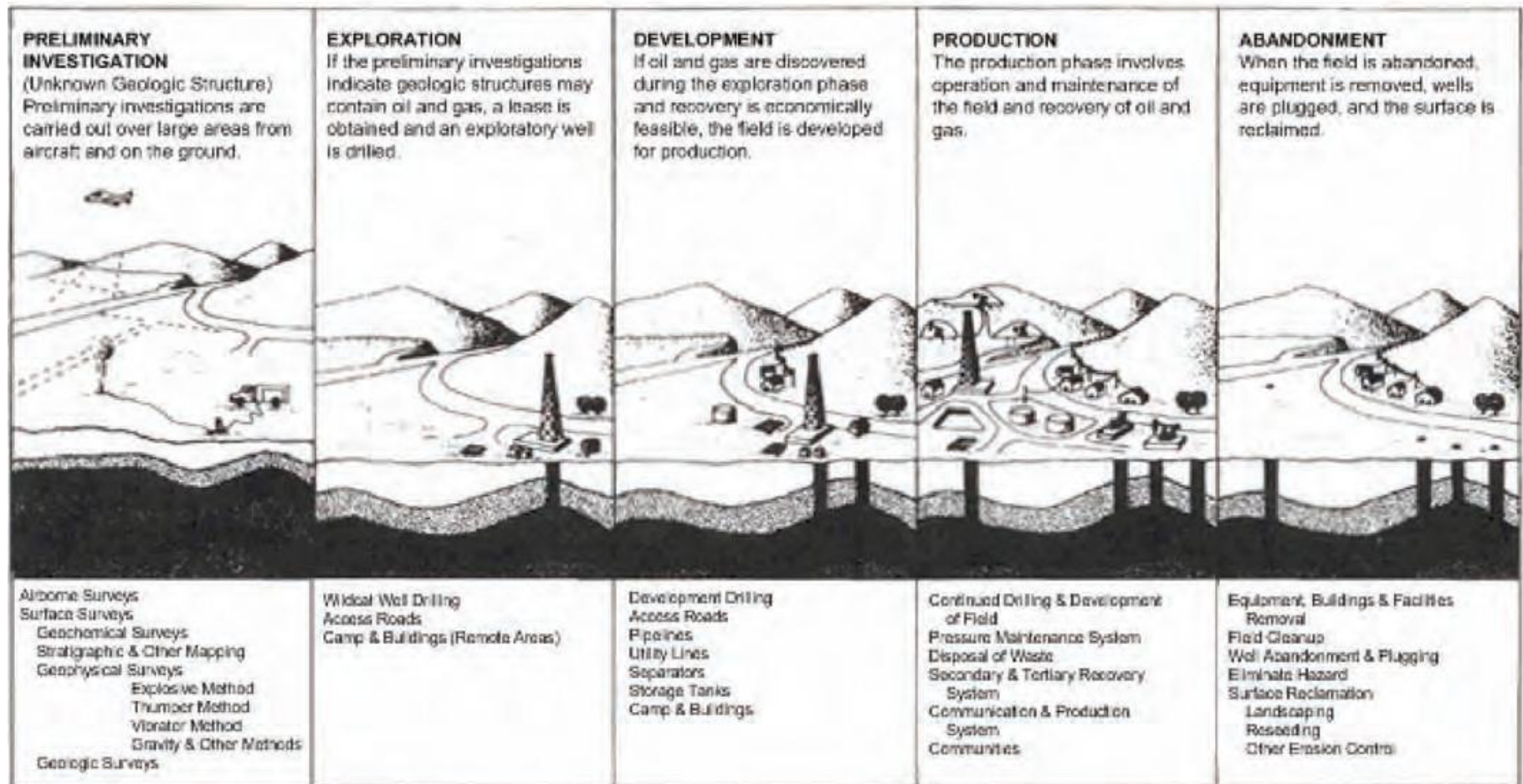
Increase in Calls

- Starting about June 2011, CTAP staff began receiving an increasing number of TA requests from the counties and municipalities experience growth related to emerging Williston Basin oil and gas development.

- Two trips to Eastern Montana, met with 24 jurisdictions to discuss their needs, concerns, opportunities, existing planning documents

*Bakken Formation assessment units in Montana and North Dakota have an estimated **3.65 billion barrels of undiscovered and technically recoverable oil reserves**, 25 times the amount (151 million barrels) previously estimated in 1995*

(USGS, 2008)

Industrial Process of Oil and Gas Extraction

PRELIMINARY INVESTIGATION
(Unknown Geologic Structure) Preliminary investigations are carried out over large areas from aircraft and on the ground.

EXPLORATION
If the preliminary investigations indicate geologic structures may contain oil and gas, a lease is obtained and an exploratory well is drilled.

DEVELOPMENT
If oil and gas are discovered during the exploration phase and recovery is economically feasible, the field is developed for production.

PRODUCTION
The production phase involves operation and maintenance of the field and recovery of oil and gas.

ABANDONMENT
When the field is abandoned, equipment is removed, wells are plugged, and the surface is reclaimed.

Airborne Surveys
Surface Surveys
  Geochemical Surveys
  Stratigraphic & Other Mapping
  Geophysical Surveys
    Explosive Method
    Thumper Method
    Vibrator Method
    Gravity & Other Methods
Geologic Surveys

Wildcat Well Drilling
Access Roads
Camp & Buildings (Remote Areas)

Development Drilling
Access Roads
Pipelines
Utility Lines
Separators
Storage Tanks
Camp & Buildings

Continued Drilling & Development
  of Field
Pressure Maintenance System
Disposal of Waste
Secondary & Tertiary Recovery
  System
Communication & Production
  System
Communities

Equipment, Buildings & Facilities
  Removal
Field Cleanup
Well Abandonment & Plugging
Eliminate Hazard
Surface Reclamation
  Landscaping
  Reseeding
  Other Erosion Control

Industrial Process of Oil and Gas Extraction

(1) Exploration

- search for rock formations associated with oil or natural gas deposits
- geophysical prospecting – generate seismic waves at the earth's surface (explosives or vibroseis); reflected waves are measured with geophones
- access road built, gravel footing for equipment placed
- drilling rig brought in or assembled onsite - rig selected dictates the properties of the access road (10 to 24 ft wide) and size of the pad necessary to support the project (.5 to ≥3 acres)
- well is drilled and cased

(2) Well development/construction

- construction of additional wells if hydrocarbons in sufficient quantities
- additional infrastructure such power lines, pipelines, and production facilities constructed
- access roads improved for increased level of traffic expected to handle production

Industrial Process of Oil and Gas Extraction, cont.

(3) Production

- rig removed and production equipment installed

- separate the mixture of liquid hydrocarbons, gas, water, and solids

- remove the constituents that are non-saleable

- sell the liquid hydrocarbons and gas

- oil is nearly always processed at an off-site refinery

- primary, secondary, tertiary production

- maintenance "workovers"

(4) Site Abandonment

- plug the well(s)

- restore the site

Major Issues

- Housing

Housing

- Temporary Housing
- Low Income Needs
- Seniors and Fixed Income Needs
- Man Camps
- Mobile Homes
- RVs

Major Issues

- Housing
- Traffic and Roads

Traffic and Roads

- Estimate 1,500 large semi-truck trips to establish a well site (50-60 days)

- 20-50 large semi-truck trips per day once drill in operation (transport, water removal, maintenance)

- Mean ADT for major county roads in Williams County is 133 (51% of those are trucks, with 56% of those multi-units); McKenzie is 191 (51% trucks, with 52% multi-unit)

Major Issues

- Housing
- Traffic and Roads
- Water and Sewer Infrastructure

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Water and Sewer Infrastructure

Bainville – At capacity with sewer system; cannot provide additional water (Dry Prairie)

Baker – Capacity to accept sewage for 800 bed crew camp?

Culbertson – At capacity with water (Dry Prairie) and wastewater; all new development will have to use individual septics and wells.

Lambert W&S District – Capacity? Water treatment plant overloading RO brine discharge to ponds; water from Sidney

Glendive – Issues of wastewater capacity for Glendive; water capacity and floodplain issues for West Glendive

Richey – Sewer lagoon at capacity

Poplar – Water quality problems

Sidney – Outdated system, needs expansion and full DEQ review

Terry – All private wells in town; very limited sewer capacity

Other Needs

- Law enforcement
- School impacts
- Fire and ambulance
- Medical facilities
- Expedited but thorough review for permits
  - Local subdivision, permit review
  - State DEQ/DPHHS review
- TA, TA, TA